This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

34.169
E.8.10 T 195.67.215*

Bd. 1875.

THE GIFT OF

CHARLES SUMNER,

OF BOSTON, MASS.

(Class of 1830).

12 July, 1867.

3 2044 097 015 705

THE

METRIC SYSTEM

EXPLAINED AND ADAPTED

TO THE

SYSTEMS OF INSTRUCTION IN THE UNITED STATES.

BY

CHARLES DAVIES, LL.D.,

AUTHOR OF A FULL COURSE OF MATHEMATICS.

NEW YORK:

PUBLISHED BY A. S. BARNES & CO.,

111 & 113 WILLIAM STREET (COR. JOHN).

1867.

Phys 42.8.67
186 [illegible]
F. Educ. T.
178.67.215

ADVERTISEMENT.

THE attention of Teachers is respectfully invited to the REVISED EDITIONS of

Davies' Arithmetical Series

FOR SCHOOLS AND ACADEMIES.

1. DAVIES' PRIMARY ARITHMETIC.
2. DAVIES' INTELLECTUAL ARITHMETIC.
3. DAVIES' PRACTICAL ARITHMETIC.
4. DAVIES' UNIVERSITY ARITHMETIC.
5. DAVIES' PRACTICAL MATHEMATICS.

The above Works, by CHARLES DAVIES, LL.D., Author of a Complete Course of Mathematics, are designed as a full Course of Arithmetical Instruction necessary for the practical duties of business life; and also to prepare the Student for the more advanced Series of Mathematics by the same Author.

The following New Editions of *Algebra*, by Professor DAVIES, are commended to the attention of Teachers:

1. DAVIES' NEW ELEMENTARY ALGEBRA AND KEY.
2. DAVIES' UNIVERSITY ALGEBRA AND KEY.
3. DAVIES' BOURDON'S ALGEBRA AND KEY.

Entered according to Act of Congress, in the year one thousand eight hundred and sixty-seven,
BY CHARLES DAVIES,
In the Clerk's Office of the District Court of the United States for the Southern District of New York.

HARVARD COLLEGE LIBRARY

PREFACE.

It is, perhaps, not generally known that the Metric System of weights and measures has been adopted, permissively, by the Congress of the United States, and that any Merchant, Mechanic or Tradesman may, if he pleases, in strict conformity to law, render all his bills and keep his accounts according to that system.

The public has, perhaps, not sufficiently considered the fact that the mind of the civilized world, now brought into sympathy and close connection by the Wires of the Telegraph, is earnestly directed to the question of uniformity in the language of business relations; and that the Metric System, if universally adopted, will afford such uniformity. To show how deep and universal this wish is, we extract from the report of the Committee on Coinage, Weights and Measures, made to the House of Representatives in May, 1866.

"In France, Spain, Belgium, and Portugal, the Metric System has been established to the exclusion of other weights and measures. In Holland, other weights are allowed in com-

pounding medicines only. Sardinia and Lombardy have long possessed the system, and it has now been extended to the whole of Italy. Greece has introduced it with some modifications. In Austria, and most of the other German States, the half kilogram has been for some time a common unit of weight in the custom-houses, and on railways. During the past year your committee are informed that delegates of all the German States, at a meeting at Frankfort-on-the-Main, signed a convention agreeing to introduce into the several States systems of which the meter should be the basis. Prussia, which had previously withheld assent, thus appears to join in the common movement. Switzerland will necessarily follow Germany, and already has units that are aliquot parts of the meter and the kilogram. The King of Sweden and Norway has appointed a commission to consider and report on the best mode of introducing the Metric System among his subjects. Denmark may be expected to follow the recommendation of the Scandinavian convention that advised it. We have the assurance of M. Kupfer, the distinguished superintendent of weights and measures of the Russian empire, that if England should adopt the metric system, Russia will also adopt it.

"The system has also made great progress among the States upon this continent.

"Six years since it was adopted by the Mexican republic, and its use decreed at once in the public offices, and after a certain period in private contracts. This period expired about the time of the imperial invasion under which that republic is now suffering. It was introduced into Chili in 1848, and is compulsory from the 1st of June, 1865. In the United States of Colombia, and in Venezuela, it has been in use along with other weights and measures since 1853. In Brazil the meter is used for cloth measure, and the liter for wine measure. In Equador the system was decreed to come into full operation on the 15th of October next. In Guatemala, San Salvador,

and the Argentine Republic, it is in partial use among the people.

"The action of England is, however, of greater importance to us, owing to our close relations with her, and with her colonies, by a common language, by our large commerce, and what is, perhaps, more pertinent to this question, by common weights and common measures.

"On the 8th of April, 1862, the House of Commons appointed a select committee of fifteen members to 'consider the practicability of adopting a simple and uniform system of weights and measures, with a view not only to the benefit of internal trade, but to facilitate trade and intercourse with foreign countries.' The committee examined thirty-nine witnesses, among whom were nine from foreign countries in which the Metric System was in force. They were generally men of distinguished intelligence, who were attending the Industrial Exhibition as commissioners from their respective countries. The list of witnesses included seven merchants, six civil engineers and architects, ten professors and teachers, two manufacturers, four actuaries and accountants, the astronomer royal, the master of the mint, and the secretary of the post-office. That committee appear to have been unanimous in recommending the introduction of the Metrical System into Great Britain.

"On the 13th of May, 1863, a bill was prepared and brought in by members of that committee, by the terms of which the Metric System of weights and measures was introduced into Great Britain, and its use by the people made compulsory after three years. This bill was passed by the House of Commons by a large majority, but does not appear to have been acted on by the House of Lords. At the next session (February, 1864) a bill was introduced by the same gentlemen which changed its purport from a compulsory to a permissive measure.

"This bill passed the House of Commons on the 29th of June, the House of Lords on the 21st of July, and became a law. The vote of the House of Commons approving a compulsory measure, and the subsequent enactment of a permissive law, must be regarded as evincing a deliberate intention to introduce the Metric System into England, and as giving up any purpose of creating a separate system founded upon the yard, the foot, or the inch; and as paving the way for the ultimate exclusive adoption of the metric scheme.

"The general consent of so many nations, highly enlightened, and deeply interested in the promotion of trade, and in popular progress, affords in itself an argument almost conclusive for, first, uniformity; second, decimalization; and, third, the metric plan."

The following Bills and Resolution accompanied the report, and were passed.

A Bill to Authorize the Use of the Metric System of Weights and Measures.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after the passage of this act, it shall be lawful throughout the United States of America to employ the weights and measures of the Metric System; and no contract, or dealing, or pleading in any court, shall be deemed invalid or liable to objection, because the weights or measures expressed or referred to therein are weights or measures of the Metric System.

Sec. 2. *And be it further enacted*, That the tables in the schedule hereto annexed shall be recognized in the construction of contracts, and in all legal proceedings, as establishing, in terms of the weights and measures now in use in the United States, the equivalents of the weights and measures expressed therein in terms of the Metric System; and

said tables may be lawfully used for computing, determining, and expressing in customary weights and measures the weights and measures of the Metric System.

A Bill to Authorize the Use in Post-Offices of Weights of the Denomination of Grams.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Postmaster-General be, and he is hereby authorized and directed to furnish to the post-offices exchanging mails with foreign countries, and to such other offices as he shall think expedient, postal balances denominated in grams of the Metric System; and until otherwise provided by law, one-half ounce avoirdupois shall be deemed and taken for postal purposes as the equivalent of fifteen grams of the metric weights, and so adopted in progression; and the rates of postage shall be applied accordingly.

Joint Resolution to Enable the Secretary of the Treasury to Furnish to each State one Set of the Standard Weights and Measures of the Metric System.

Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury be, and he is hereby authorized and directed to furnish to each State, to be delivered to the governor thereof, one set of the standard weights and measures of the Metric System, for the use of the States respectively.

The Academy of Sciences, at its last annual meeting in the city of Washington, earnestly recommended the introduction of the Metric System into the systems of

Public Instruction; and in this recommendation many professors, and other men of science, have concurred.

These considerations, strengthened by the conviction that the system is nearer perfect than any other which can be reached, and that its adoption would greatly simplify and abridge all the applications of Numbers to the various operations of commerce and business, have induced me to give it the form adapted to practical instruction, and to incorporate it permanently into my course of Mathematics. I have accordingly made the Metric System a part of my University and Practical Arithmetics.

CHARLES DAVIES.

FISHKILL-ON-HUDSON, January, 1867.

METRIC SYSTEM OF WEIGHTS AND MEASURES.

The primary base, in this system, for all denominations of weights and measures, is the one-ten-millionth part of the distance from the equator to the pole, measured on the earth's surface. It is called a METER, and is equal to 39.37 inches, very nearly.

The change from the base, in all the denominations, is according to the decimal scale of tens: that is, the units increase ten times, at each step, in the ascending scale, and decrease ten times, at each step, in the descending scale.

MEASURES OF LENGTH.

Base, 1 meter = 39.37 inches, nearly.

Table.

Ascending Scale.					Descending Scale.		
Myriameter.	Kilometer.	Hectometer.	Decameter.	Meter. UNIT.	Decimeter.	Centimeter.	Millimeter.
1	1	1	1	1	1	1	1

The names, in the ascending scale, are formed by prefixing to the base, Meter, the words, Deca (ten), Hecto (one hundred), Kilo (one thousand), Myria (ten thousand), from the Greek numerals; and in the descending scale, by prefixing Deci (tenth), Centi (hundredth), Milli (thousandth), from the Latin numerals.

Hence, the name of a unit indicates whether it is greater or less than the standard; and, also, how many times. The table in thus read:

10 millimeters	make	1	centimeter.
10 centimeters	make	1	decimeter.
10 decimeters	make	1	METER.
10 METERS	make	1	decameter.
10 decameters	make	1	hectometer.
10 hectometers	make	1	kilometer.
10 kilometers	make	1	myriameter.

Table of Equivalents.

Myriameter.	Kilometer.	Hectometer.	Decameter.	METER.	Decimeter.	Centimeter.	Millimeter.
.	.	.	.	.	.	1=	10
.	.	.	.	.	1=	10=	100
.	.	.	.	1=	10=	100=	1,000
.	.	.	1=	10=	100=	1,000=	10,000
.	.	1=	10=	100=	1,000=	10,000=	100,000
.	1=	10=	100=	1,000=	10,000=	100,000=	1,000,000
1=	10=	100=	1,000=	10,000=	100,000=	1,000,000=	10,000,000

Table of Equivalents in English Measure.

1 Millimeter = 0.0394 inches, nearly.
1 Centimeter = 0.3937 "
1 Decimeter = 3.9370 "
1 METER = 39.37 in. = 3.280833 ft.
1 Decameter = 32 ft. 9.7 in.
1 Hectometer = 19 rd. 14 ft. 7 in.
1 Kilometer = 4 fur. 38 rd. 13 ft. 10 in.
1 Myriameter = 6 mi. 1 fur. 28 rd. 6 ft. 4 in.

Besides a clear apprehension of the length of the base, 1 meter, it is well to consider the length of the largest unit, the

myriameter, equal to nearly 6 and one-fourth miles; and also the length of the smallest unit, the millimeter, about four-hundredth of an inch. Compare, also, each of the smaller measures, the decimeter and centimeter, with the inch.

When, in the metric system, the value of any single unit is fixed in the mind, the values of all the others may be readily apprehended, since they always arise from multiplying or dividing by 10.

NOTE.—In all the tables, the UNIT is in small capitals, and should be constantly referred to.

Methods of Reading.

The number 25365.897 meters, is read, in English,

Twenty-five thousand three hundred and sixty-five meters, and 897 thousandths of a meter. But in the language of the metric system, it may be read,

Two myriameters, 5 kilometers, 3 hectometers, 6 decameters, 5 meters, 8 decimeters, 9 centimeters, and 7 millimeters. It may also be read, beginning with the lowest denomination, 7 millimeters, 9 centimeters, &c., &c.

In reading, remember that the unit of any place is *ten* times as great as the unit of the place next at the right, and *one-tenth* of the unit of the place next at the left. Hence, the change from one unit to another, and the methods of reduction and reading, are identical with those in the system of decimal currency.

1. Write, numerate, and read, five hundred and ninety-six hectometers.

2. Write, numerate, and read, eighty-nine thousand and forty-one centimeters.

Questions.—What is the primary base of the metric system? To what portion of the earth's surface is it equal? What is its length? What is the ascending scale from the meter? What is the descending scale? What is the length of a myriameter? According to what law do the different units increase and decrease?

MEASURES OF SURFACES, OR SQUARE MEASURE.

Base, 1 Are = the square whose side is 10 meters.
= 119.6 square yards, nearly.
= 4 perches or square rods, nearly.

The unit of surface is a square whose side is 10 meters. It is called an ARE, and is equal to 100 square meters.

Table.

Hectare.	ARE. UNIT.	Centare.
1	1	1

The table is thus read:

100 centares make 1 ARE.
100 ares make 1 hectare.

Table of Equivalents.

Hectare.	ARE.	Centare.
	1 =	100
1 =	100 =	10,000

Equivalents in acres, roods, and perches.

1 Centare = 1.195985 sq. yards, nearly.
1 ARE = 3.95367 perches.
1 Hectare = 2A. 1R. 35.367P.

MEASURES OF VOLUMES.

Base, 1 leter = the cube or the decimeter.
= 61.023378 cubic inches.
= a little more than a wine quart.

Questions.—What is the primary base of the measure for surfaces? To what is it equal, in square yards? What are the denominations, beginning with the least? To what is the centare equal? To what is the hectare equal?

The unit for the measure of volume is the cube whose edge is one-tenth of the meter—that is, a cube whose edge is 3.937 inches. This cube is called a LETER, and is one-thousandth part of the cube constructed on the meter, as an edge.

Table.

Ascending Scale.				Descending Scale.		
Kiloleter, or Stere.	Hectoleter.	Decaleter.	LETER. UNIT.	Decileter.	Centileter.	Millileter.
1	1	1	1	1	1	1

The table is thus read:

10	millileters	make	1 centileter.
10	centileters	make	1 decileter.
10	decileters	make	1 leter.
10	leters	make	1 decaleter.
10	decaleters	make	1 hectoleter.
10	hectoleters	make	1 kiloleter or stere.

Table of Equivalents.

Kiloleter, or Stere.	Hectoleter.	Decaleter.	LETER.	Decileter.	Centileter.	Millileter.
.	.	.	.	.	1 =	10
.	.	.	.	1 =	10 =	100
.	.	.	1 =	10 =	100 =	1,000
.	.	1 =	10 =	100 =	1,000 =	10,000
.	1	10 =	100 =	1,000 =	10,000 =	100,000
1 =	10 =	100 =	1,000 =	10,000 =	100,000 =	1,000,000

NOTE.—The kiloleter, or stere, is the cube constructed on the meter, as an edge. Hence, the leter is one-thousandth part of the kiloleter.

Equivalents in Cubic Measure.

1 millileter	=	.061023 cubic inches.
1 centileter	=	.610234 cubic inches.
1 decileter	=	6.102338 cubic inches.
1 LETER	=	61.023378 cubic inches.
1 decaleter	=	610.233779 cubic inches.
1 hectoleter	=	6102.337795 cu. in. = 3.5314454 cu. ft.
1 kiloleter, or stere	=	61023.377953 cu. in. = 35.314454 cu. ft.

NOTE.—Law of change in the units, and methods of reading, are the same as in linear measure.

DRY MEASURE.

EQUIVALENTS IN THE WINCHESTER BUSHEL.

Since 1 bushel = 2150.4 cu. in. ; 1 pk. = 537.6 cu. in. ; 1 qt. = 67.2 cu. in. ; 1 pt. = 33.6 cu. in. ; therefore,

1 Millileter	= .001816 pints.
1 Centileter	= .018160 pints.
1 Decileter	= .181606 pints.
1 LETER	= 1.816060 pints.
1 Decaleter	= 1 pk. 1.080300 qt.
1 Hectoleter	= 2 bu. 3 pk. 2 qt. 1.6 pt.
1 Kiloleter, or stere	= 28 bu. 1 pk. 4 qt.

NOTE.—The leter, or standard, is a little less than 1 quart, and the stere, nearly 30 Winchester bushels.

LIQUID MEASURE.

EQUIVALENTS IN THE WINE GALLON.

Since 1 wine gallon contains 231 cubic inches, 1 quart will contain 37.75 cubic inches ; 1 pint, 28.875 cubic inches ; and 1 gill, 7.21875 cubic inches, we have,

---

Questions.—What is the unit for the measure of volumes? To what is it equal in cubic inches? What part is it of the cube on the meter? Name all the denominations of volume. What is the unit of Dry Measure? To what is it equal? To what is the stere or kiloleter equal?

1 Millileter	= 0.008453 gills
1 Centileter	= 8.084534 gills.
1 Decileter	= 0.845320 gills.
1 LETER	= 1 qt. 1.1335 pt.
1 Decaleter	= 2 gal. 2 qt. 1.1335 pt.
1 Hectoleter	= 26 gal. 1 qt. 1 pt. 1.34 gills.
1 Kiloleter, or stere	= 1 tun, 12 gal. 1 pt. 1.44 gills.

WEIGHTS.

Base, 1 gram = weight of a cubic centimeter of rain-water.
= 15.432 grains, Troy, nearly.
= .0352746 ounces, Avoirdupois, nearly.

The unit of weight is also equal to the one-millionth part of the weight of a cubic meter of pure rain-water, weighed in vacuum. It is called a GRAM, and is equal to 15.432 grains, Troy, which is equal to .0352746 ounces, Avoirdupois, very nearly.

Table.

Ascending Scale.							Descending Scale.		
Millier, or ton.	Quintal.	Myriagram.	Kilogram.	Hectogram.	Decagram.	GRAM. UNIT.	Decigram.	Centigram.	Milligram.
1	1	1	1	1	1	1	1	1	1

The table is thus read :

10 milligrams	make	1 centigram.
10 centigrams	make	1 decigram.
10 decigrams	make	1 gram.
10 grams	make	1 decagram.
10 decagrams	make	1 hectogram.
10 hectograms	make	1 kilogram.
10 kilograms	make	1 myriagram.
10 myriagrams	make	1 quintal.
10 quintals	make	1 millier; or ton.

Table of Equivalents.

Millier, or ton.	Quintal.	Myriagram.	Kilogram.	Hectogram.	Decagram.	Gram.	Decigram.	Centigram.	Milligram.
.	.	.	.	.	.	.	.	1=	10
.	.	.	.	.	.	.	1=	10=	100
	.	.	.	.	.	1=	10=	100=	1,000
.	.	.	.	.	1=	10=	100=	1,000=	10,000
.	.	.	.	1=	10=	100=	1,000=	10,000=	100,000
.	.	.	1	10=	100=	1,000=	10,000=	100,000=	1,000,000
.	.	1=	10=	100=	1,000=	10,000=	100,000=	1,000,000=	10,000,000
.	1=	10=	100=	1,000=	10,000=	100,000=	1,000,000=	10,000,000=	100,000,000
1=	10=	100=	1,000=	10,000=	100,000=	1,000,000=	10,000,000=	100,000,000=	1,000,000,000

Equivalents in Avoirdupois and Troy Weights.

1 Milligram	=	0.0154	grains, Troy.
1 Centigram	=	0.1543	grains, "
1 Decigram	=	1.5432	grains, "
1 Gram	=	15.4327	grains, "
1 Decagram	=	0.3527	ounces, Avoirdupois.
1 Hectogram	=	3.5274	ounces, "
1 Kilogram	=	2.2046	pounds, "
1 Myriagram	=	22.046	pounds, "
1 Quintal	=	220.46	pounds, "
1 Millier, or ton	=	2204.6	pounds, "

Note.—Law of change in the units, and methods of reading, the same as in Linear Measure.

NATURE OF THE METRIC SYSTEM.

The Metric system is based on the meter. From the meter, three other units are derived; and the four constitute the primary units of the system. They are:

Questions.—What is the unit of weight? To what is it equal in Troy weight? To what is it equal in Avoirdupois? Name all the units of the weight, from the lowest to the highest. To what is the millier, or ton, equal?

METER = 39.37 inches, nearly: unit of length.
ARE = a square on 10 meters: unit of surface.
LETER = a cube whose edge is a decimeter: unit of volume.
GRAM = the weight of a cube of rain-water, each edge of which is a centimeter: unit of weight.

From these four units all others are derived, according to the decimal scale.

Every system of Weights and Measures *must* have an *invariable unit* for its base—and every other unit of the entire system should be derived from it, according to a fixed law.

The French Government, in order to obtain an invariable unit, measured a degree of the arc of a meridian on the earth's surface; and from this computed the length of the meridional arc from the equator to the pole. This length they divided into ten million equal parts, and then took one of these parts for the unit of length, and called it a METER. The length of this meter is equal to 1 yard, 3 inches, and 37 hundredths of an inch, very nearly. Thus they obtained the length of the unit which is the base of the Metric System of Weights and Measures.

The next step was to fix the *law* by which the other units of the system should be obtained from the base. As the scale of tens is the simplest law by which we can pass from one unit to another, that scale was adopted, and the larger units are formed by multiplying the base continually by 10, and the smaller, by dividing it continually by 10.

It would seem impossible that so simple a system of computation and record, forming a common language for the whole family of man, and reaching every operation of trade and commerce, should not at an early day become universal.

TO CHANGE FROM ONE SYSTEM TO THE OTHER.

To change, in Linear Measure, from the Metric to the Common system.

Rule.

Multiply the meters and decimals of a meter by 3.280833 (the value of a meter), *and the product will be the result in feet.*

To change from the Common to the Metric system.

Rule.

Reduce the linear measure to feet and decimals of a foot, and then divide by 3.280833 *: the quotient will be the result in meters and decimals of a meter.*

Examples.

1. In 5961.874 meters, how many feet and inches?
2. In 874163 meters, and 37 hectometers, how many feet and inches?
3. Express 320 rods, 5 yards and 6 inches in the Metric Measures.
4. Express 1 mile, 3 furlongs, 39 rods and 5 yards in the Metric Measures.

To change, in Square Measure, from the Metric to the Common system.

Rule.

Reduce the number to ARES *and decimals of the* ARE *: then multiply by* 3.95367, *and the product will be the result in perches.*

To change, from the Common system, to the Metric system.

Rule.

Find the value of the number in perches and decimals of a perch: then divide by 3.95367, *and the quotient will be the result in* ARES *and decimals of the* ARE.

Examples.

1 In 6127 ares, 4 hectares and 3 centares, how many acres, roods and perches?

2. In 327 ares, 15 hectares and 89 centares, how many square feet?

3. In 4 acres, 3 perches and 200 square feet, how many hectares, ares and centares?

4. In 1375 square yards and 250 square feet, how many hectares, ares and centares?

To change, in measures of volume, from the Metric to the Common system.

Rule.

Reduce the number to LETERS *and decimals of the* LETER: *then multiply by* 61.023378, *and the product will be the result in cubic inches.*

To change, in measures of volume, from the Common to the Metric system.

Rule.

Reduce the number to cubic inches: then divide by 61.023378, *and the quotient will be the result in* LETERS *and decimals of the* LETER.

Examples.

1. In 6 kiloleters, 9 hectoleters, 6 decaleters, 8 leters and 4 centileters, how many cubic feet and inches?

2. In 8 hectoleters, 9 decaleters, 27 leters and 5 milliers, how many cubic yards, feet and inches?

3. Change 27 cubic yards, 16 cubic feet and 16 cubic inches, to the Metric measures.

4. Change 40 cubic yards, 25 cubic feet and 1167 inches, to the Metric measures.

To change, in weights, from the Metric to the Common system.

Rule.

Reduce the number to grams and decimals of a gram: then multiply by 15.423, *and the product will be the result in grains Troy; or, multiply by* .0352746, *and the product will be ounces in Avoirdupois.*

To change, in weights, from the Common to the Metric system.

Rule.

Reduce the number to Troy grains, or to Avoirdupois ounces: then divide by 15.423, *or by* .0352746, *and the quotient will be* GRAMS *and decimals of the* GRAM.

Examples.

1. Change 4 quintals, 6 kilograms, 4 decagrams, 7 grams and 6 centigrams, to Avoirdupois and Troy weights.

2. Change 2 milliers, 6 myriagrams, 9 grams, 4 decagrams and 9 milligrams, to Troy and Avoirdupois.

3. Change 1 T. 3 cwt. 3 qr. 20 lb. 6 oz., to the Metric weights.

4. Change 16 lb. 11 oz. 4 pwt. 19 gr., Troy, to the Metric weights.

Ques.—In linear measure, how do you change from the Metric to the Common system? How do you change from the Common to the Metric system?

In square measure, how do you change from the Metric to the Common system? How do you change from the Common to the Metric system?

In measures of volume, how do you change from the Metric to the Common system? How do you change from the Common to the Metric system?

In weights, how do you change from the Metric to the Common system? How do you change from the Common to the Metric system?

MAY 5 1984

FEB 18 1992